

FIGURE 1

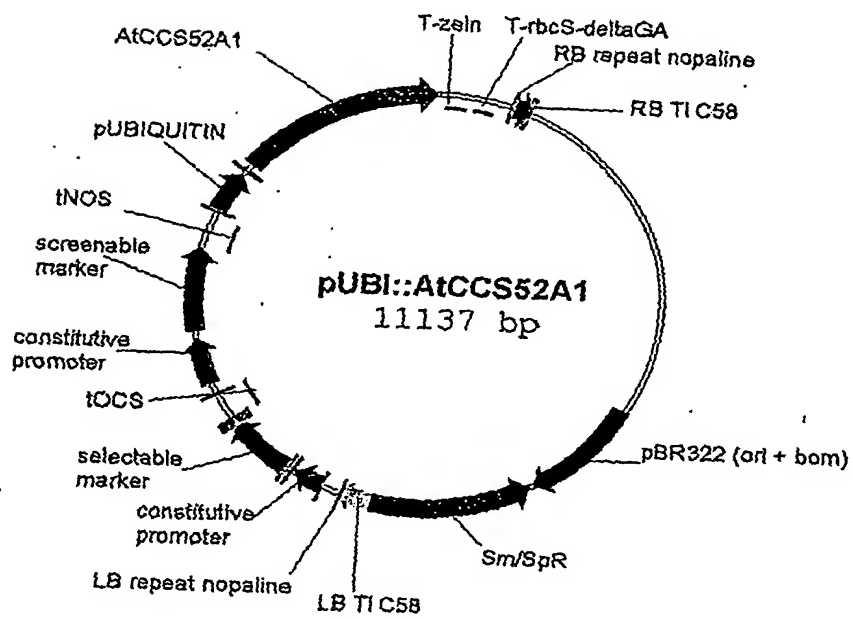
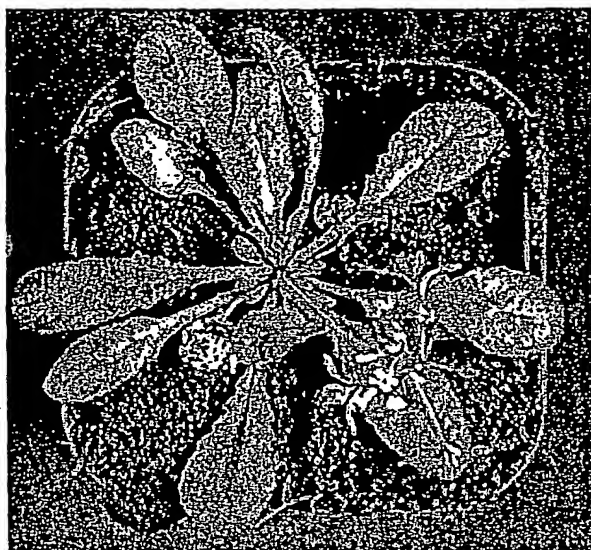
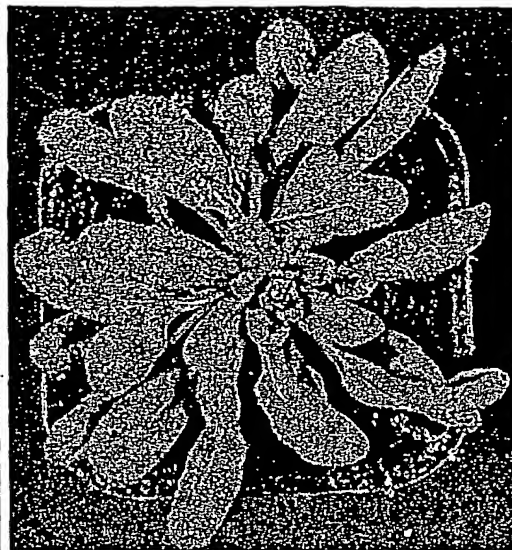


FIGURE 2

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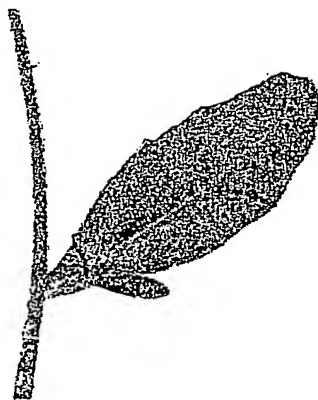


Wild type

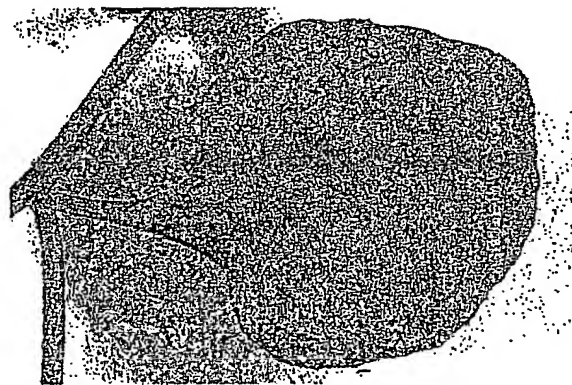


Transgenic: pUBI::AtCCS52A1

FIGURE 3



Wild type

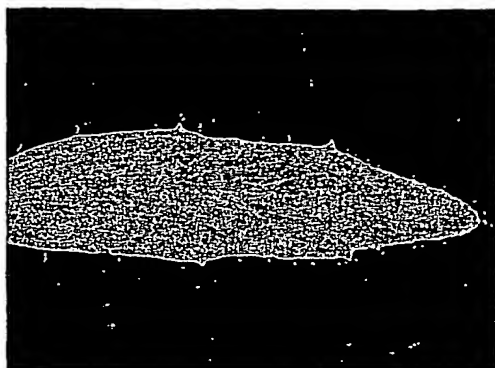


Transgenic: pUBI::AtCC S52A1

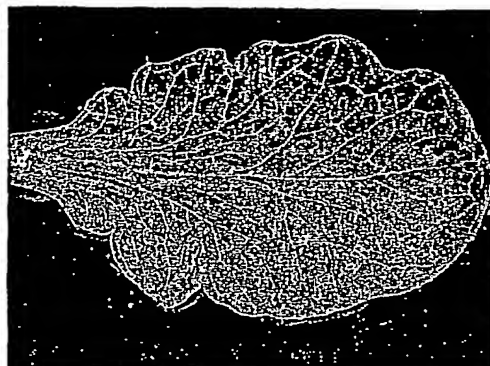
FIGURE 4

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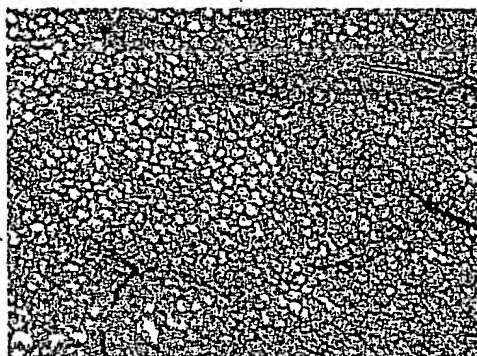


Wild type

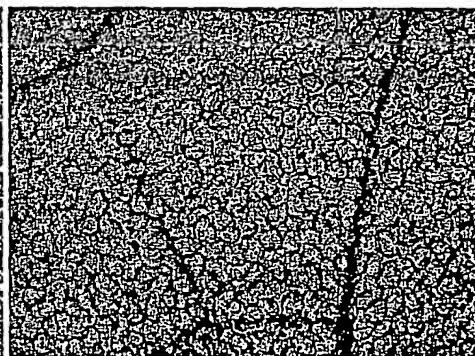


Transgenic: pUBI::AtCCS52A1

FIGURE 5



Wild type



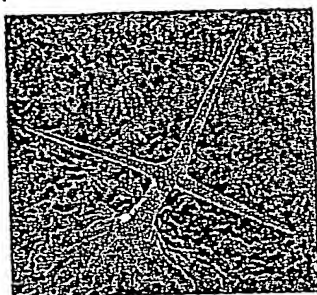
Transgenic: pUBI::AtCCS52A1

FIGURE 6

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A Wild type



B Transgenic: pUBI::AtCCS52A1

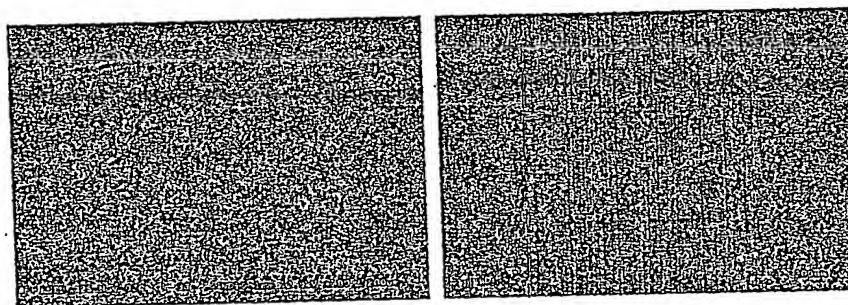
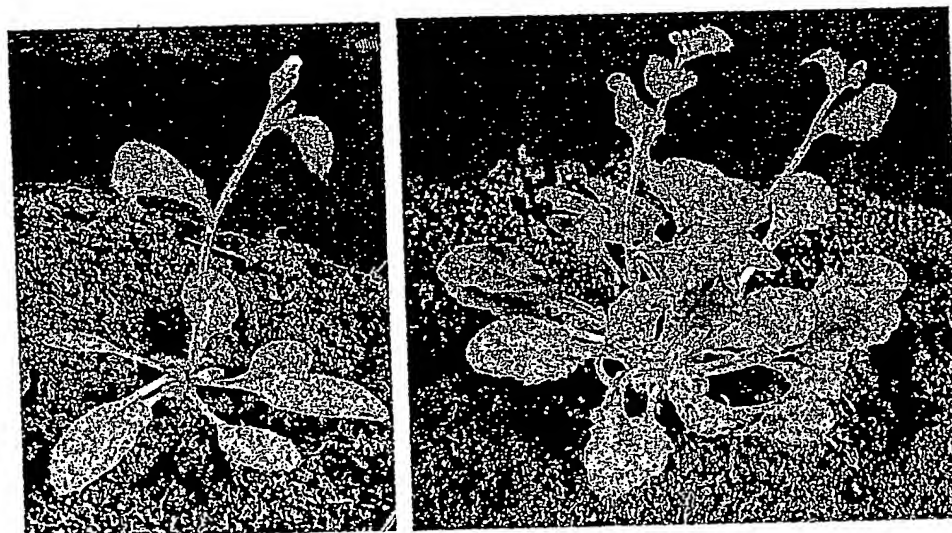


FIGURE 7



Wild type

Transgenic: p2S2::AtCCS52A1

FIGURE 8

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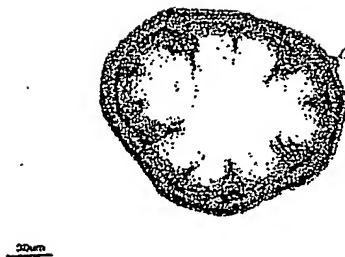
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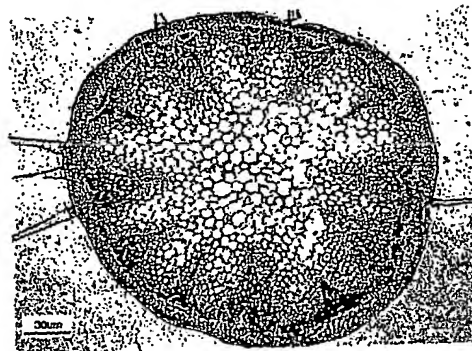
Wild type

Transgenic: pUBI::AtCCS52A1

FIGURE 9



Wild type

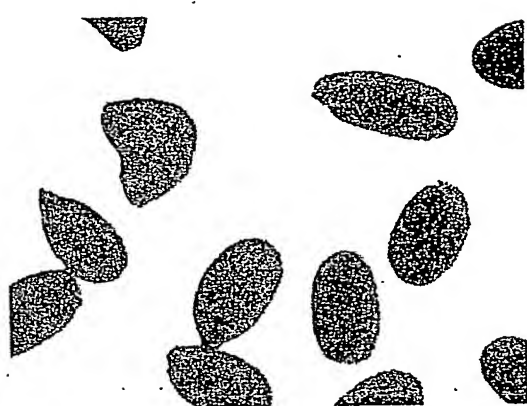


Transgenic: pUBI::AtCCS52A1

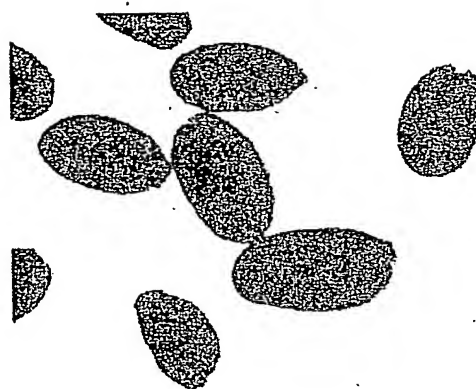
FIGURE 10

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Wild type



Transgenic: pUBI::AtCCS52A1

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FIGURE 11

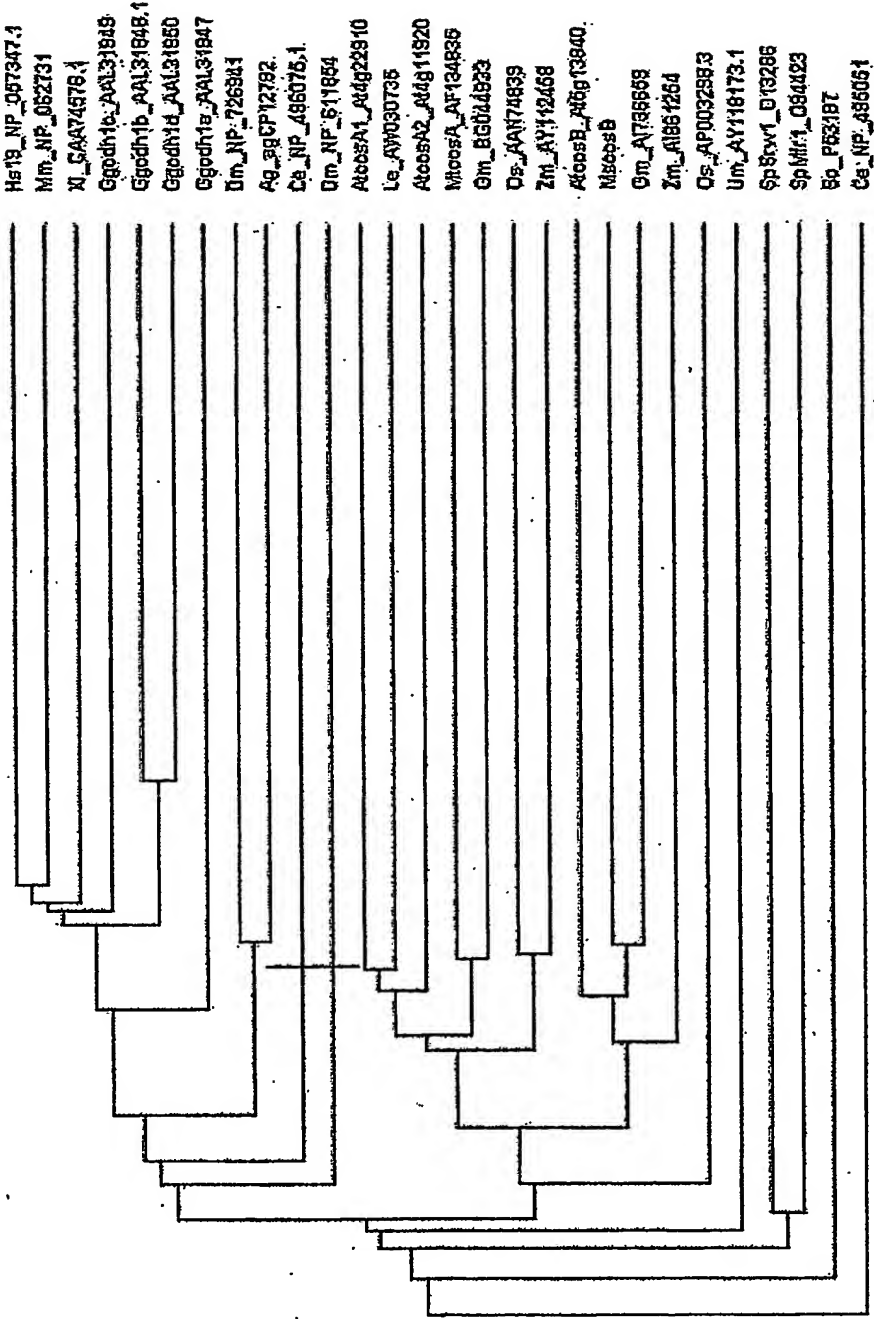


FIGURE 12

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CCS52 motifs

| Gene | C-box | Motif 1 |
|------------------------|---------------|-----------------|
| AtCCS52A1 (At4g22910) | 62 DRFIPSR 68 | 70 GSNFALFDL 78 |
| AtCCS52A2 (At4g11920) | 53 DRFIPSR 59 | 61 GSNFALFDL 69 |
| AtCCS52B (At5g13840) | 46 DRFIPCR 52 | 54 SSRLHAFDL 62 |
| Rice CCS52A (AKO70642) | 52 DRFIPSR 58 | 60 GSNLALFDL 68 |
| Consensus | DRFIPXR | XSXXXXFDL |
| SEQ ID NO | SEQ ID NO 16 | SEQ ID NO 7 |

| Motif 2 | Motif 3 | Motif 4 |
|--------------------------|---------------------------|----------------|
| 88 EDGAGSYATLLRAAMFG 104 | 117 SSSRNIFRFTETHRSL 133 | 207 SKVTKL 211 |
| 81 EDGAGSYASLLKTALFG 97 | 111 SPSPNIFRFTETQSRSL 127 | 198 SKVTKL 202 |
| 73 EGGNEAYSRLKSELFG 89 | 111 SPCTNMLRFTDRSNS 129 | 203 SKVTKL 207 |
| 93 TPASSPYCALLRAALFG 109 | 137 PATGNIFRFKAEVPRNA 152 | 228 SKVTKL 232 |
| XXXXXXXXXXLLXXXXFG | XXXXNXXREKX (2 or 4) RXX | SKVTKL |
| SEQ ID NO 8 | SEQ ID NO 9 | SEQ ID NO 10 |

| Motif 5 | Motif 6 |
|---------------------|-----------------------|
| 289 DHVSKLAGHKS 300 | 329 HSTQPVLYKYSEH 340 |
| 283 DHVSKLKGHKS 293 | 330 HSTQPVLRFCHEH 341 |
| 288 DFVSKLVGHKS 298 | 335 HSQQPILKLTEH 346 |
| 313 DYISRLAGHKS 323 | 352 HSAHPVLKYTEH 363 |
| DXXSXLXGHKS | HSXXPXLXXXEH |
| SEQ ID NO 11 | SEQ ID NO 12 |

| Motif 7 | Motif 8 | Motif 9 |
|-------------------------|-------------------------|------------------------|
| 371 WNTTNTNTHLSSIDT 384 | 403 LYLAVSPDGQTIVT 416 | 471 EIGSSFFGRITTIR 483 |
| 364 WNTTNTNTHLNCVDT 377 | 426 LYLAVSPDGQTIVT 439 | 463 EIGALSFGRTTIR 476 |
| 369 WNTTNGNQNLNSIDT 382 | 431 LYLATSPDGQTIVT 444 | 469 DTGLWSLGLTQIR 481 |
| 394 WNTTNTNMHLNCVDT 107 | 456 LYLAI SPDGQTIVT 469 | 495 SIGATSFVRSYIR 508 |
| WNTTXXXXLXXXTDT | LYLAXSPDGQTIVT | XXGXXXXXXXXXIR |
| SEQ ID NO 13 | SEQ ID NO 14 | SEQ ID NO 15 |

FIGURE 13

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SEQ ID NO 1: *Arabidopsis thaliana* CCS52A1 cDNA, At4g22910

ATGGAAGAAGAAGATCCTACAGCAAGCAATGTGATAACGAATTCGAATTCCTTCATCTATGAG
AAACCTATCGCCGGCGATGAATACTCCGGTGGTTTCACTTGAGTCACGAATCAATCGATTAA
TCAATGCTAATCAATCTCAATCACCATCACCATCATCACTATCAAGGTCTATATACTCTGAT
AGATTTATCCCCAGTAGATCCGGATCCAATTTGCTCTTTTCGATCTATCTCCTTCTCCTAG
TAAAGATGGTAAGGAAGATGGAGCTGGCTCTTACGCTACTCTGTTGCGTGCGGCGATGTTTG
GTCCTGAGACGCCGAGAGAAGAGAGATATTACTGGGTTTTCTTCTTCCAGGAATATTTTAGG
TTTAAGACGGAGACTCATCGGTCTTTGAATTCGTTTTCTCCTTTTGGTGTGATGATGATTC
TCCTGGTGTTTCTCATAGTGGTCTGTAAAGCTCCAGGAAAGTGCCGCGATCGCCGTATA
AGATTCCTGATCTCGTTGACTTTAGATCTTTGGTTTCGATAATGCATGAAACAATTTGTGAT
CTTTGTGATGTTTTGGTCTCTGAGGGTCTAGAATTTGAGTCTGAGGTATTGGATGCACCGGC
CTTGCAAGATGATTTTTATCTGAATCTTGGAATGGTCTGCACAAAATGTTCTAGCAGTGG
GACTAGGGAACGTGTGTATTTATGGAATCTGTGATGCTAGCAGCAAGGTTACTAAGTTATGTGAT
CTCGGAGCTGAGGATAGTGTGCTCAGTGGGTTGGGCGTTACGTGGAACCTCATCTGGCTGT
TGGAAGCTAGTACCGGGAAAGTTCAGATATGGGATGCGTCACGCTGCAAGAGAACAAGAACA
TGGAAGGTCATCGTCTAAGAGTTGGAGCCCTGGCATGGGGTTCATCGGTTCTGTCTATCTGGT
AGCAGAGACAAGAGTATTCCTCAGAGAGACATAAGGTGTCAAGAAGATCATGTGAGTAAAT
GGCAGGTCATAAATCTGAGGTATGCGGACTCAAGTGGTCTTATGACAACAGAGAGCTAGCAT
CTGGTGGAAACGACAATAGGCTTTTTGTATGGAACCAACATTCAACACAACCGGTTTTGAAA
TATAGTGAACACACTGCAGCTGTTAAAGCCATTGCTTGGTCTCCTCATGTTTATGGGCTTCT
TGCTTCTGGTGGTGGTACTGCTGATAGATGCATACGTTTTTGGAAATCAACCACGAATACTC
ATTTAAGTTCATAGATACTTGAGTCAAGTATGCAATCTAGCTTGGTCTAAGAAGCTAAAC
GAGCTTGTAGCACACACGGATACTCTCAGAACCAATCATTGTCTGGAAATACCAACCAT
GTCCAAAATTGCTACTCTAACCGGTACACATACCGAGTCTTATACCTTGCGGTTTACCCG
ATGGACAGACGATTGTAACAGGAGCAGGAGATGAAACCTTAAGGTCTGGAATGTTTTCCCT
TCCCCAAAATCTCAGAACACGGATAGTGAAATCGGGTCGTCTTTCTTGGTAGAACAACAAT
TCGGTGAGAAAGTTACTTTCAAAACACACAGAAAAAGTCATAAATCTTGATTTCTTCAGCAG
CAGCCAGCTTGAGTTGGTCTCAACCAACTTTTTTACACGGGAGCAGAGAGTCATTAA
TTCTTTTACACACGGATGCAACAAGATCTAACCCTTTTGATTTAATCAGCATCTTTGGGTTT
CCATCAAGATGCACAACATTTTCCCCAAAATTTTCAAAGTGATATCTTTATTCAATTTT
TCTTCATATATCAAAATATAGTTTCTTTTGTATTTATTTACTTACGAACACAACATTTTATA
AAATAAGCCCATGATAATAATGCAATAATTCGTTACCATTCTCTT

SEQ ID NO 2: *Arabidopsis thaliana* CCS52A1 protein

MEBEDPTASNVITNSNSSSMRNLSPAMNTPVVSLESRLINRLINANQSQSPSPSSLSRSIYSD
RFIPSRSGSNFALFDLSPSPSKDGKEDGAGSYATLLRAAMFGPETPEKRDITGFSSSRNI FR
FKTETHRSLNSFSPFGVDDDSPGVSHSGPVKAPRKVPRSPYKILDLDVDFRSLVSIHETI CD
LCDVLVSEGLEFESEVLDAPALQDDFYLNLDVWSAQNVLA VGLGNCVYLWNACSSKVTKL CD
LGAEDSVCSVGWALRGTHLAVGTSTGKVQIWDASRCKRTRTMEGHRLRVGALAWGSSVLS SG
SRDKSILQRDIRCQEDHVS KL AGHKSEVCGLKWSYDNRELASGGNDNRLFVWNQHSTQPV LK
YSEHTAAVKALAWSPHVHGLLASGGGTADRCIRFWNTTNTNHLSSIDTCSQVCNLAWSKNVN
ELVSTHGYSQNQII VWKYPTMSKIATLTGHTYRVLVLA VSPDGQTI VTGAGDETLRFWNVFP
SPKSQNTDSEIGSSFFGRRTIR

FIGURE 14

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SEQ ID NO 3: *Oryza sativa* CCS52A cDNA, AK070642

ATCCCCAAATCTCTCGCCCCACCCATGGATCACCACACCACCACCTGCCGCCGCCGCCG
CGCGGTGCGCGATGGAGAACTCCGCGTCTCTCAAGCCGCCACCCCGCGTCCACCCCGTCG
TCGCGCCTCGCGCCGCGCGCTCTCCCGCGTCTCTCCGCGGCGCGCACCCCTCCCGTC
CTCCTCCGCGCCACGCCGCGCTCGCGACGGTCTACAGCGACCGTTTCATCCCCAGCCGCG
CCGGATCCAACCTCGCGTCTTTCGACCTCGCCCCGTCGCCGTCCCACCACGACGCCGCCGCC
GCCGCCGCTCCCCCGCGCGCGCCCCCTCCGGATCTACCCCGGCCTCGTCGCCCTACTG
CGCGTCTCTCCGCGCGCGCTCTTCGGCCCCACCACGCCCGACCGGTGGCGTCGTCGGCGT
CCGCGTGCTCTCTCTCTCTCCGCGGGGCGTCGCCGTGGGCTCACCCGCCACCGGCAAC
ATATTCAAGGTCAGGTCGCCCGGAATGCTAAGCGCGCCCTTTTCTCCGACGGGA
CGACGAGGCGTGCTCTTCCCGGGGTGTTACGACGAGGGGCACTGGCCCCAGGAAGATCC
CTAGGTCACCTTATAAGGTGCTGGATGCTCCCGCATTCGAGGATGACTTCTACTGAACCTT
GTGGATTGGTCTTCGCATAATATCCTTGAGTTGGATTGGGGAATTGTGTCTACTTATGGAA
TGCATGCAGCAGGTACCAAGCTACGTGATTGTTGGGGTGGATGACAATGTCTGTTTCAG
TGGGTGGGCGACAGCGTGGCACTCACCTTGCTGTAGGGACAAACCAAGGCAAGTTTCAGGTA
TGGGATGCCACTCGTTGTAAGAGAATAAGAACCATGGAAAGCCATCGGATGCGAGTAGGTGC
TCTTGCGATGGAATTCATCATTGCTTTCGTCAGGCAGTCGTGACAAGAGCATCCTTCACCATG
ATATCCGTGCCAGGATGATTATATTAGTAGACTTGCTGGGCATAAATCGGAGGTCTGTGGG
CTCAAGTGGTCTTATGATAACCGTCAGCTTGTCATCTGGTGGTAATGACAACAGACTTTATGT
ATGGAATCAACACTCGGCGCACCCGGTACTGAAGTATACTGAGCATAACAGCAGCTGTCAAAG
CTATTGCGTGGTCACCTCATCTTCATGGGCTGCTTGTCATCTGGTGGAGGAAGTGCAGATAGA
TGCATACGATTTTGAATACCACCACGAATATGCACCTAAATTGCGTCGACACAGGCAGTCA
GGTCTGTAATCTTGTATGGTCAAAGAATGTTAATGAGCTTGTTAGCACTCATGGATATTCTC
AAAATCAGATAATTGTTTGGCGATACCAACAATGTCAAAGCTCGCCACATTGACAGGCCAT
ACATATAGGGTATTATATTTAGCCATCTCCCAGATGGACAGACTATAGTAACTGGCGCTGG
TGATGAAACGCTTCGGTTTTGGAACGTGTTCCATCTCCCAAGTCCAGAGTTCTGACAGCC
TAAGTAGCATCGGGGCCACATCATTGTTAGGAGCTACATCCGGTGACACTGAGATGTGGTA
ATCTAATAACACTTGGCTCATAAGTCATAAACAATACTGCAGCAGAGTGTGATGATCATCAA
TATCATTCCATTGTACCATTGTCATCACCAGTTCATGAACCATCAAACCTAGCCAAATTTT
AGAGATAGTAGGATGCAGAATGGTGAAGTGGCTCGCAGACCTCGGAGTGGCTCATTGCTG
AATGCTGTATATATTTATTCATTGGCTTTGTAGGAGCGAAGATGGCAAACACTGACCATCCG
CAATGTACCATTGATAAGTTCACGGCCTCCTGTTTTTGTGTTTGTGCTGAGTCAACTTGGAGCT
GGAGCTCTTATGTATACCATGCTAGGGCTTAACAACATTGGCCAACCTCATGATGCTCATTCG
ATCCAAGTTGGAATATGCTAAGGAAGCTGGAGAATTTCTGGTGC

SEQ ID NO 4: *Oryza sativa* CCS52A protein

MENSASSKPPTPASTPSSRLAAAPSSRVSSAAPHSPSSSAPTASRTVYSDFIPSRAGSN
LALFDLAPSPSHDAAAAAASPGAPPPSGSTPASSPYCALLRAALFGPTTPDRVASSASA CS
SSSSAGASPVGSPATGNIFRFKAIEVPRNAKRALFSDGDDEGVLPFGVFTTRGTGPRKIPR SP
YKVLDAAPALQDDFYLNLDWSSHNILAVGLGNCVYLWNACSSKVTKLCDLGVDDNVCSVGWA
QRGTHLAVGTNQKQVWDATRCRIRTMESHMRVVGALAWNSSLSSGSRDKSILHHDIR A
QDDYISRLAGHKSEVCGLKWSYDNRQLASGGNDNRLYVWNQHSAPVLPKYTEHTAAVKAI AW
SPHLHGLLASGGGTADRCIRFWNTTNNMHLNCVDTGSQVCNLVWSKNVNELVSTHGYSQN QI
IVWRYPTMSKLTATLTGHTYRVLILAISPDGQTIVTGAGDETLRFWNVFPSPKSQSSDSL SI
GATSFVRSYIR

FIGURE 14 (continued)

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SEQ ID NO 5: *Oryza sativa* genomic DNA encoding CCS52B protein, AP003298

ATGCTAATGGGCGGCGCCGCATGGCAGAGAGAGTACAACGGCTACTCGGGTGGGGGGCCAC
AGTCAGAGGGGAGACAGCTCGTGCTAGAAAAAGTAGGCGACTTGCCCACTCCAACCAAAGTGA
CCGTTGCAACCTCATCTCCGCTCCTCTTCTCCTCCTCGTCGTCGTTGTCGTCGTCGGCGGC
GCATCCAGCCTCGACGTGCCGCGCGCGCCGCGCGCCGCGCGCCTCAACGTGCCGCGGGCGAT
GGCGGGGGGGCTCCGCTCGATCCCGCCGTGCGCTCCCCGGCGCCGCTCCTCCTCGACGTCC
CCAAGACGCCATCCCCTTCCAAGACCAGTACAGCGACCGCTTCATCCCCTGCCGCTCCTCC
TCCCGCCTCCACAACCTTCGCCCTCCTCGACCGCGACCGCGCCTCCCCCTCCTCCACCACCGA
CGACGCCCCCTACTCCCGCCTCCTCCGCGCCGAGATCTTCGGCCCGGACTCCCCCTCCCCGG
CTCCCTCCTCCCCAACACCAACCTCTTCCGCTTCAAGACCGACCACCCCTCGCCCAAATCG
CCCTTCGCCGCTCCGCCGCGCCACCGCGGCCACTACGACTGCACCGCGGCTCCGCTGA
ATCCTCCACGCCGCGCAAGCCGCGCCAGGAAGTCCCCAAGACCCCGCACAAAGGTCTTGACG
CGCCGTGCGCTGCAGGACGACTTCTACCTCAATCTTGTGCGACTGGTCGTCGAGAACACGCTC
GCCGTGCGCCTCGGGAATTGCGTCTACCTCTGGTTCGGCTTCCAATTGCAAGGTCACCAAGCT
CTGCGATTTGGGGCCAGGGACAGCGTCTGCGCTGTGCACTGGACCCGAGAAGGCTCCTATC
TTGCCATCGGCACCAGCCTTGGCGATGTCCAGATTTGGGATAGCTCTCGCTGTAAACGGATT
AGGAACATGGGAGGACACCAACACGGACTGGTGTATTAGCATGGAGCTCCCGAATCTTGTC
CTCCGGTAGCAGGGACAAGAACATATTGCAGCATGACATCCGTGTCCAAGTGACTATATCA
GCAAGTTCTCAGGGCACAGATCAGAGAACCATGTATGTGCATCAAGTGACAGTTTTTTTTGGT
CAGGTCTGTGGACTGAAATGGTTCGCACGACGACCGTGAGCTTGCATCCGGTGGAATGATAA
TCAGCTGCTAGTATGGAACCAACGTTTCGCAGCAGCCGATATTGAGGCTGACAGAACACACAG
CTGCAGTTAAAGCAATAGCATGGTCAACACATCAGCAAGGCCTCCTGGCATCAGGTGGTGGA
ACCGCTGATAGGTGTATCAGGTTCTGGAACACGGTTAATGGAAACATGCTGAATTAGTGGA
CACAGGCAGCCAGGCGACTTGTGAGCACTCATGGGTATTCCCAAACCAATCATGGTGTGG
AAGTACCCATCTATGTCAAAGGTTGCTACTCTAACTGGACACACGCTGCGAGTGCTTTACCT
TGCAATGTACCAACAATAGTAACAGGAGCCGGGGATGAAACCCCTCAGATTTTGAATATTTT
TCCTTCAATGAAGACACAGGTAGGCATCTATTGTTGA

SEQ ID NO 6: *Oryza sativa* CCS52B protein, BAB98864

MLMGRPAWQREYNGYSGGGPTVRGRQLVLEKVGDLPTPTKVTVATSSPLLFLLLVVVVVVG
ASSLDVPAAPAPRLNVPPAMAGGLRLDPAVASPARLLLDVPKTPSPSKTTYSDRFIPCRSS
SRLHNFALLDRDRASPSSTDDAPYSRLRLRAEIFGPDSPSPAPSSPNTNLFKFDHPSPKS
PFAASAAATAGHYDCTAGSAESSTPRKPPRKVPKTPHKVLDAPSLQDDFYLNLDWSSQNTL
AVGLGNCVYLWSASNCKVTKLCDLGPDSVCAVHWTREGSYLAIGTSLGDVQIWDSSRCKRI
RNMGGHQTRTGVLAWSSRILSSGSRDKNILQHDIRVPSDYISKFSGHRSENHVCASSDSFFG
QVCGLKWSHDDRELASGGNDNQLLVWNQRSQQPILRLTEHTAAVKAIAWSPHQQGLLASGGG
TADRCIRFWNTVNGNMLNSVDTSQATCEHSWVFPKPNHGVEVPIYVKG CYSNWTHAASALP
CNVTTIVTGAGDETFRFVNIFPSMKTQVGIIYC

SEQ ID NO 7: consensus motif 1 of CCS52 protein

XSXXXXFDL

FIGURE 14 (continued)

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SEQ ID NO 8: consensus motif 2 of CCS52 protein

XXXXXXXXXXLLXXXXFG

SEQ ID NO 9: consensus motif 3 of CCS52 protein

XXXNXXRFX_(2 or 4)RXX

SEQ ID NO 10: consensus motif 4 of CCS52 protein

SKVTKL

SEQ ID NO 11: consensus motif 5 of CCS52 protein

DXXSXLXGHKS

SEQ ID NO 12: consensus motif 6 of CCS52 protein

HSXXPXLXXEH

SEQ ID NO 13: consensus motif 7 of CCS52 protein

WNTTXXXXLXXXDT

SEQ ID NO 14: consensus motif 8 of CCS52 protein

LYLAXSPDGQTIVT

SEQ ID NO 15: consensus motif 9 of CCS52 protein

XXGXXXXXXXXXIR

SEQ ID NO 16: consensus C box

DRFIPXR

SEQ ID NO 17: consensus motif 1 of CCS52A proteins

GSN(F/L)ALFD(L/I)

SEQ ID NO 18: prm03191

GGGGACAAGTTTGTACAAAAAGCAGGCTTCACAATGGAAGAAGAAGATCCTACAGC

SEQ ID NO 19: prm01392

GGGGACCACTTTGTACAAGAAAGCTGGGTTTCTCACCGAATTGTTGTTCTAC

FIGURE 14 (continued)

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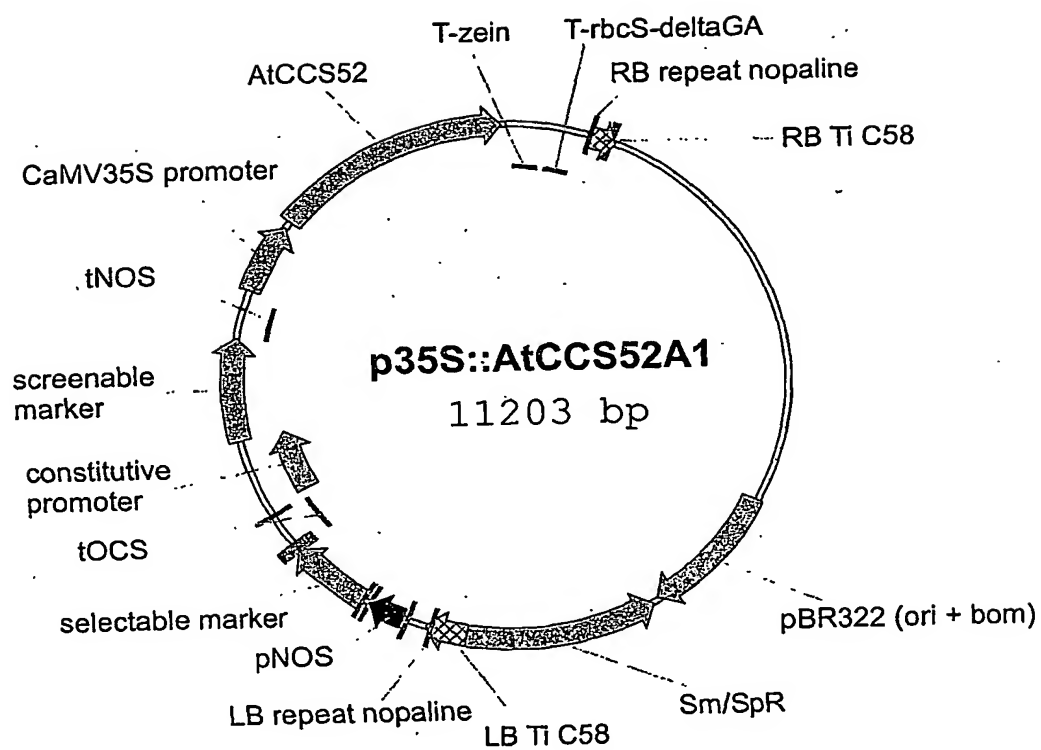
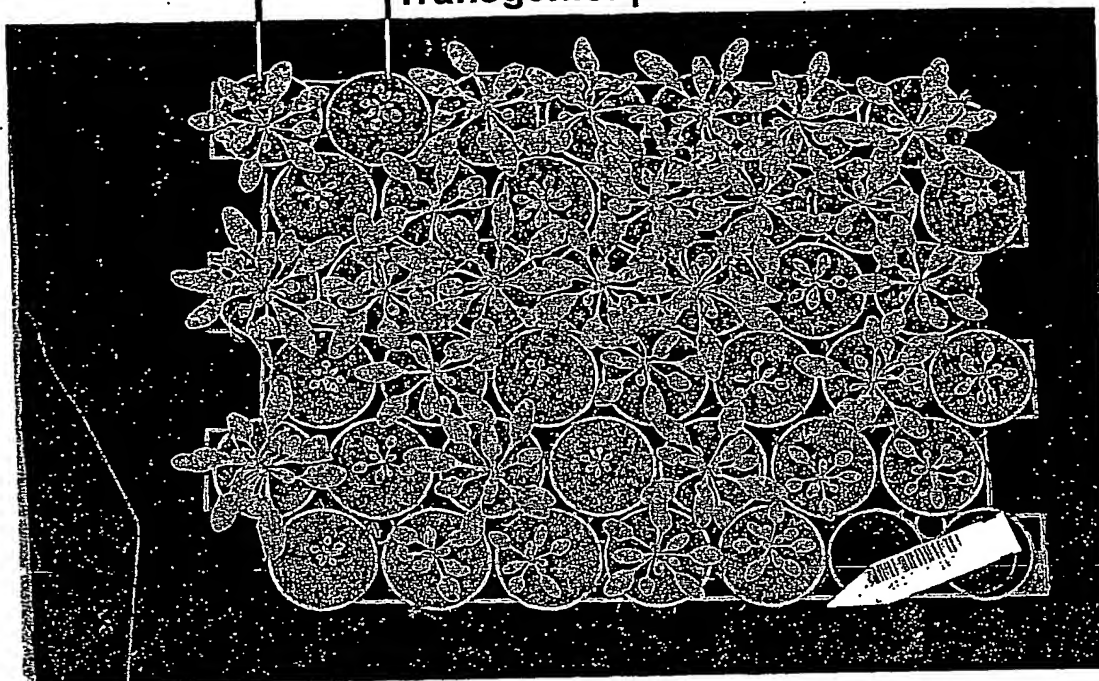


FIGURE 15

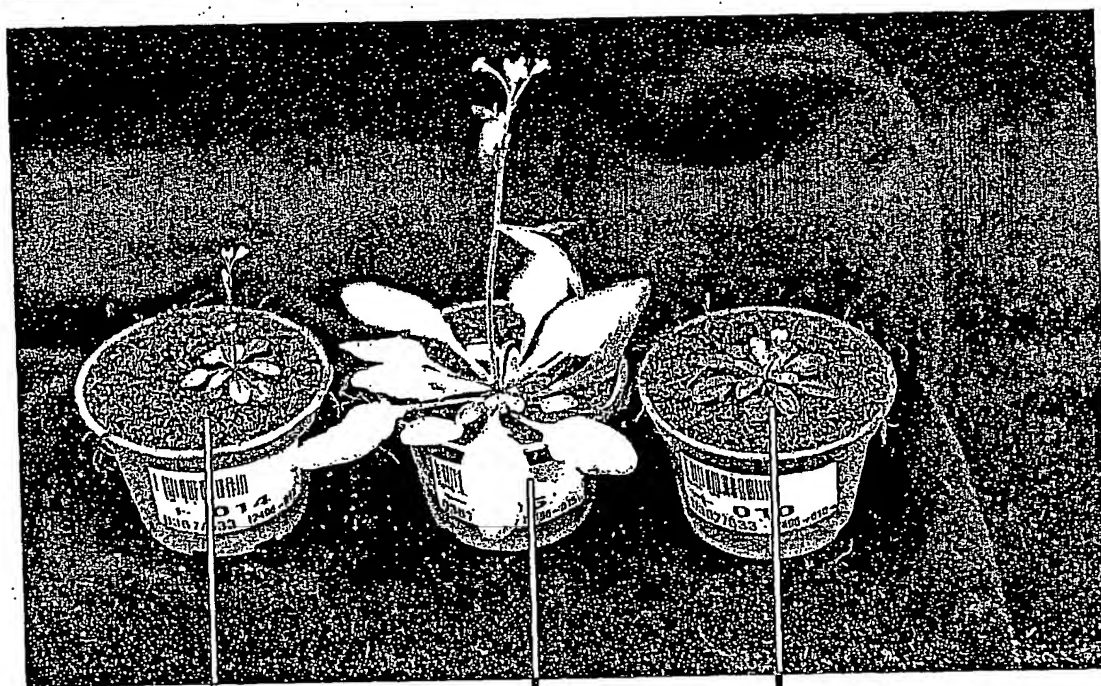
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Wild type

Transgenic: p35S::AtCCS52A1



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Transgenic:
p35S::AtCCS52A1

Wild type

Transgenic:
p35S::AtCCS52A1

FIGURE 16

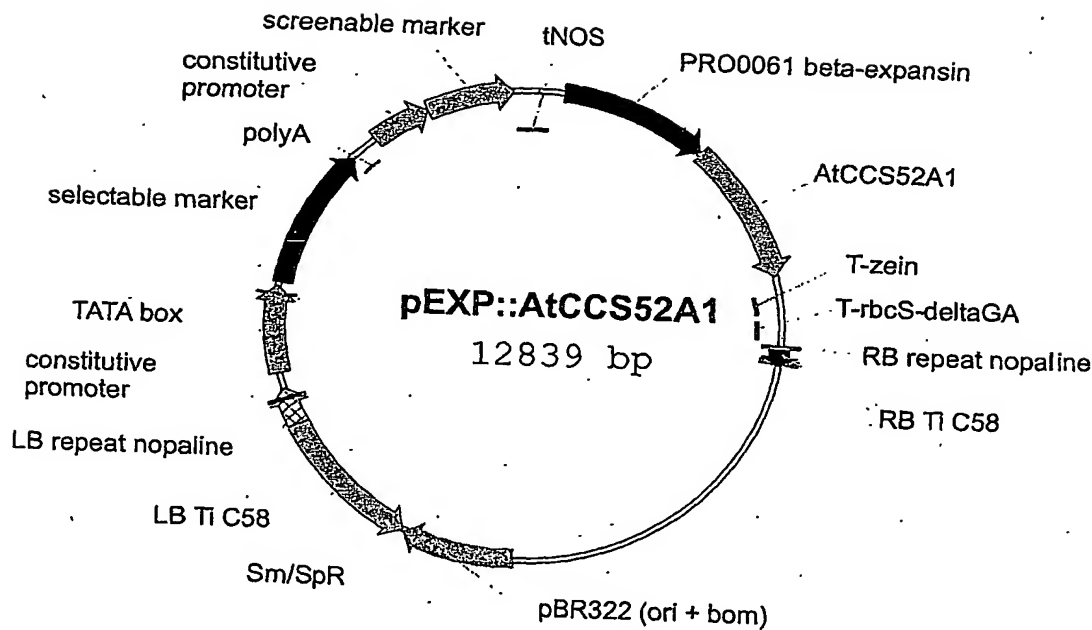


FIGURE 17